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EXAMINER
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PADGETT, MARIANNE L

ART UNIT	PAPER NUMBER
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1792

MAIL DATE	DELIVERY MODE
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08/05/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/773,796	<b>Applicant(s)</b> VEERASAMY ET AL.	
	<b>Examiner</b> MARIANNE L. PADGETT	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3-5, 7-11, 16-33, 35 and 37-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-11, 18, 21 and 22 is/are allowed.
- 6) ☒ Claim(s) 3-5, 16, 17, 19, 20, 23-33, 35 and 37-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

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1. It is noted with respect to the provisional **obviousness double patenting** (ODP) rejections, made in sections 10 & 11 of the action mailed 1/4/2008, that in SN 11/463,579 that all method claims (6-15) have been canceled, while analogously in SN 11/463,577, all method claims (21-30) have also been canceled, thus removing all of the ODP rejections over these applications, such that claims 7-11, 18 & 21-22 previously indicated as allowable, may again be so indicated. Also of interest is copending Veerasamy et al. (7,402,350 B2) to the same inventors & same patent family, but directed to product claims only.

Claims 7-11, 18 & 21-22 appear allowable at this time.

2. Applicants' submission of **Table II** as a correction to the technically noncompliant amendment of 12/5/2007 is formally acceptable, however on review of paragraph [0101], which describes the table, the examiner has a question as to the appropriateness of the placement of the " $\Delta$ ". Applicant has inserted "D-peak  $\Delta \pm 5 \text{ cm}^{-1}$ " as a column caption, however the preceding paragraph says that the "D-peak" is a position in Raman spectroscopy, "while the associated  $\Delta$  values describe peak widths", thus it would seem that for "cell 1", G- & D-peak positions would be described as peak position  $\pm \Delta$  are  $1494 \pm 5 \text{ cm}^{-1}$  &  $150 \pm 5 \text{ cm}^{-1}$ , respectively, such that the placement of the " $\Delta$ " in the table is either confusing or incorrect. Clarification of record & table if necessary is desired.

The **disclosure is objected** to because of the following informalities: the above issue concerning the meaning & appropriate placement of the " $\Delta$ " in table II is confusing, such that it appears to probably be inconsistent or confusing with respect to preceding written disclosure.

Appropriate correction is required.

3. **Claims 26-27, 30, 37-38 & 40** are rejected under 35 U.S.C. **112**, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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Applicants amended claims 26 & 37 to specifically include three types of source gas, i.e. acetylene, or acetylene + N<sub>2</sub>, or acetylene + NF<sub>3</sub>, where the plasma beam composition is about  $\geq 95\%$  C<sub>2</sub> ions species, however this is clearly no more supported than previous claim language, as there is no disclosure (either cited applicants or found by examiner) of any range of ions species in the newly claimed value range, let alone C<sub>2</sub> ions species. Paragraph [0063] on page 16 of the original specification provides only a value of  $<5\%$  for the C<sub>4</sub> ion species (the next most significant after the C<sub>2</sub> ions species) for the ionic composition of the plasma beam (i.e. with respect to ALL ions present), and only when the only source gas is acetylene & the pressure is below  $5 \times 10^{-5}$  mbars. As this disclosure does not indicate that the only two ionic species are C<sub>2</sub> & C<sub>4</sub> species, one cannot conclude from the specification that the C<sub>2</sub> species are in the range now claimed, even for only the use of acetylene gas, let alone for its use with nitrogen gas or NF<sub>3</sub>, thus the new on amendment to the claims introduces a new set of **New Matter**.

Note that the plasma beam formed from just the acetylene gas source and delivered straight to the substrate lacking any other constraints, must be considered to contain up all ionic components of the plasma as the claim process does not separate any plasma components, but explicitly delivers the plasma as a whole in a beam, thus an acetylene plasma will contain neutral particles & electrons, which need not be considered for the ionic composition of the plasma beam, plus all ionic species. From the disclosure of [0063], the set of all ionic species would include: the dominant species is C<sub>2</sub> = (C<sub>2</sub>H<sub>2</sub><sup>+</sup>, C<sub>2</sub>H<sup>+2</sup>, C<sub>2</sub><sup>+2</sup>,...); the next most dominant at  $<5\%$  is C<sub>4</sub> = (C<sub>4</sub>H<sub>4</sub><sup>+</sup>, C<sub>4</sub>H<sub>3</sub><sup>+2</sup>,...); however other ions species, which physically must be present due to the composition of acetylene and nature of the plasma would include: H<sub>1</sub> = (H<sup>+</sup>, H<sup>+2</sup>, ...); H<sub>2</sub> = (H<sub>2</sub><sup>+</sup>, H<sub>2</sub><sup>+2</sup>,...); C<sub>1</sub> = (CH<sub>2</sub><sup>+2</sup>, CH<sub>3</sub><sup>+</sup>, ...); C<sub>6</sub> = (C<sub>6</sub>H<sub>6</sub><sup>+</sup>, ...); C<sub>3</sub>, etc., where the only disclosure with respect to all other ions species is that they are less significant than the second most significant ion species C<sub>4</sub>, which as the discussion is in terms of percentages of ion composition could be construed to mean that each is less than the percentage of C<sub>4</sub> ion species, but the examiner finds **NO**

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evidence to conclude that the total of ALL other ions species is  $<5\%$ , to support the new limitation of  $\geq 95\% C_2$ . In fact, this new claim language suggests an enablement issue concerning how in the claim plasma, applicants have selectively capped the concentration of hydrogen ions in the plasma to less than the concentration of the  $C_4$  ion species, when all the possible groupings of carbon ion species include those that have lost hydrogen, thus would have been expected to contribute to the hydrogen ion component of the ionic composition.

As applicants' amended claims have explicitly specified the option of including  $N_2$  or  $NF_3$ , i.e. sources of more ionic components for the ionic composition, which must be part of the total non- $C_2$  ion species that is less than  $5\%$  in order to have the claimed  $95\% C_2$  ion species, this has even less support, as no values are given for when the option of using nitrogen feedstocks is chosen, and it is not reasonable to assume that the percentages for using acetylene gas alone are applicable when depositing nitrogenated films with additional gases present, that of necessity will create additional ionic species. For these reason, the amended claims are further considered to encompass **New Matter**.

With respect to **claims 30 & 40**, applicants have improved the support for these claims, as these values are derived from experimental data of table II, however are for experimental depositions from acetylene plasmas only, where all deposits were made on magnetic layers on aluminum substrates using a particular set of conditions for highly ionized plasma to create a plasma beam source, while these claims depend from independent claims 3 & 31, which only require generic carbon source deposited on generic substrate, where the only necessary overlap between the plasma conditions of the experimental section & the claims would appear to be that the plasmas directed straight towards the substrate. Therefore, the support for producing this range of "plasmon peak" values for all plasmas containing carbon ions in a stream as claimed, does not appear adequate, **given** the specific values produced for different thicknesses of films for what appears to be one specific set of conditions for an acetylene plasma, and especially as the examiner cannot determine from the evidence presented how much, if any, role the use of acetylene &

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specific plasma parameters & underlying substrate material, etc., have on these measured values. On what basis do applicants propose to extend the achievement of the specific values from the specific example, to the much broader claimed process, which is not commensurate in scope with the broad claimed procedure? Would any DLC deposit of thicknesses as recited in table II have these values regardless of substrate material; &/or regardless of source gas, for carbon gas sources other than acetylene; &/or regardless of RF power or use of alternative energy sources.... ? For these claims not to encompass New Matter, there must be some evidence that the process as claimed is commensurate in scope with producing the range of values, i.e. that the specification as originally filed would suggest that the broadly claimed procedures of independent claims 3 or 31 would necessarily have been expected to produce values as achieved in the much more specific experiment.

4. **Claims 26-27, 30, 37-38 & 40** are rejected under 35 U.S.C. **112, first** paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

With respect to **claims 26-27 & 37-40**, it is not clear from the specification how one of ordinary skill in the art would be **enabled** to produce ionic compositions as claimed for the plasma stream/beam, especially with respect to hydrogen ion species in the ionic composition, as combined with all other ions species except C<sub>2</sub> ion species, to total less than 5 % (see above discussion). There appears to be even less enablement for producing claimed ion composition percentage requirements when specified nitrogen feedstocks are part of the plasma source gas.

While the issues with respect to enablement of **claims 30 & 40** as discussed in section 5 of the action mailed 1/4/2008 are improved by the narrowing of scope of plasmon peak values that is bounded by maximum & minimum values explicitly disclosed in table II, the issues as discussed above concerning whether the production of these values is enabled for the scope of the independent claims, as discussed

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above in section 3, must be considered, as the examiner does not find evidence that one of ordinary skill in the art would be enabled to produce these values of for carbon deposits in the much more broad scope of the independent claims, as opposed to the very narrow example from which the claimed values derived.

5. The following is a quotation of 35 U.S.C. **103(a)** which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. **Claims 3-5, 16-17, 20, 23-30 & 37-38** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Baldwin et al.** (5,616,179), previously discussed in sections 12, 8, 7 & 7 of the actions mailed 3/29/2005, 11/16/2005, 7/21/06 (7/6/06) & 9/6/2007, respectively.

To reiterate, **Baldwin et al.** (5,616,179) teach an end-Hall ion source, with a straight path from source to substrate (figures 1 & 2), the teachings therein (see also citation by applicants on page 9 of their 6/1/2006 response) on col. 3, line 65-col. 4, line 12 and col. 6, lines 31- 52, indicate that most species emitted by the end-Hall ion source will traverse the distance from the source to the substrate, without making any gas phase collisions involving subsequent energy loss. While it is indicated on col. 6 that **when methane** gas is used, all the ion species are not carbon containing and some  $H^+$  &  $H_2^+$  will be produced, as seen on col. 4, lines 13-23, methane is **not** the only hydrocarbon contemplated for use by

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Baldwin et al., **but alternate hydrocarbons**, such as **acetylene** are also contemplated. From Baldwin et al.'s comments, it appears expected that "all the ion current was assumed to be **carbon containing**" (emphasis added) for such alternatives, thus would **inherently have a narrower & more uniform ion species distribution** when using alternative explicitly taught gases, such as **acetylene**, due to compositional & energetic considerations, such as its inherent well-defined reaction path. Note that Baldwin et al.'s teachings when discussing most species emitted from their ion source that are arriving at the substrate, are including neutral species, nonionized radicals, etc., as being important to the formation of their a-C:H deposition, however applicants' claims while **limiting parameters** concerning the **ions** in the stream from the plasma, do **not exclude** the presence of these neutral species, etc., since they are not ions, but may come from a plasma. While Baldwin et al. indicates that the various neutral species are important in the formation of the deposit, the teachings **also indicate** that the **positive ion hydrocarbon species** are also **important**, hence they must be said to promote the formation of the taught a-C:H deposition (as well as DLC (abstract)), which is the material being deposited. Applicants' claims do not prohibit or exclude other influences from contributing to the formation of the claimed  $sp^3$  C-C bonds, they merely require energizing the **ions** to form a stream, where "the substantially uniform **impact** energy distribution and the substantially uniform weight distributions **promote** formation" thereof (or the like; emphasis added), which the process of Baldwin et al. also unquestionably does. It would appear from the teachings of Baldwin et al. that when hydrocarbons, such as the taught **acetylene**, which can be assumed to **have all ion species being carbon-containing** as taught, that they would **correspond** to a **substantially uniform weight distribution** as claimed (lacking any actual clear evidence to the contrary for taught acetylene) and would have been affecting, hence promoting formation of  $sp^3$  carbon-carbon bonds. Note: col. 1, line 62-col. 2, line 17 discussing the presence of  $sp^3$  in deposits & col. 2, lines 66-67+ stating "A primary object of the present invention is to provide a process for depositing diamondlike



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carbon films...", where the examiner takes notice that by definition DLC films will have percentages of  $sp^3$  C-C bonds as claimed.

(Note the mentioned "broad beam" irradiation previously cited by applicants in column 9, is an optionally supplied ion source using Ar + N<sub>2</sub>, that is not the carbon ion source & used in an alternate mode process, hence is not relevant to the discussion.)

With respect to Baldwin et al.'s important feature of "2. The ranging energy distribution of the hydrocarbon-based positive ions in the beam", this statement does not tell what is meant by "ranging energy distribution", hence must be read in light of the rest of the disclosure in the patent, such as col. 4, line 53 that states "the ion beam energy is **about 100 eV**" (emphasis added), or col. 5, lines 17-34 teaching "it is believed that when the **average energy per deposition carbon atom is about 100 eV**, then hard, substantially optical transparent electrically resistive and non-electron-emissive a-C:H is produced. When the average energy per deposited carbon atom is **about 50 eV**, then softer...a-C:H is produced.... One reason that  $V_{anode}$  values must be higher than expected is that there is a **particular range** of ion energies produced at any given V and that there are low energy, reacted neutral species present as well..." (emphasis added), hence it is apparent from these teachings that by choosing a **particular energy** in a range of energies for the positive ions one produces a-C:H depositions with different hardnesses, i.e. different  $sp^3$  carbon-carbon bond percentages, where these **energy distributions centered** around the exemplary 100 eV energies for the deposited carbon atoms, i.e. impact energies, **clearly are promoting** the claimed bond structures and appear to be **sufficiently uniform within the context claimed**, with clear teachings concerning use of energy to achieve different hardness properties, especially considering discussions of using like precursors & like peak energy values as discussed by applicants to produce the hard a-C:H films. As previously noted, at taught energies, **ion implanting** mechanisms would have been expected to be involved during the **coating** process, especially as the thickness of the coating increased,

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such that there is ion mixing at the interface, along with the coating, hence this appears consistent with applicants' claimed **subplantation**.

With respect to the specifically claimed width of the energy distribution being "approximately 5% of a bias voltage", it is noted that average energy is related to Baldwin et al.'s  $V_{anode}$ , hence may be considered related to some sort of bias voltage, although the percentage cannot be determined from the given information, & cannot be measured by the PTO, however given taught use of anode voltages (i.e.  $\equiv$  bias voltages) to control film properties with the use of energies suggestive of those claimed & used with the suggested acetylene as the source gas, like energy distributions would have been expected, as acetylene has a limited number of ion species that would be produced, thus available to be accelerated by their charge with respect to the anode voltage & defined by that voltage. With respect to the claim of "a dominant species of carbon ion and a non-dominant species of carbon ion", there will inherently be in any plasma, species that have higher percentages (i.e. can be called dominant species) and those with lower percentages, and at least some or one of the carbon ion species of Baldwin et al.'s plasmas, such as those employing the suggested acetylene, would reasonably have been expected to be at or below 5%. Note that the "comprises" language with respect to ionic species does not limit how many non-dominant species are present, such that these claims are not considered to distinguish over Baldwin et al, including newly (unsupported)  $\geq 95\%$   $C_2$  ionic components with acetylene usage, especially considering taught use of the same acetylene source gas & that only the ion species present in the stream are being limited & defined.

Applicants' point (page 9 of 6/1/2006 response) about Baldwin et al.'s use of hydrogen to prevent formation of graphite like carbon bonds, is not considered to effect the relevance of the Baldwin et al. reference, because applicants' claims do not exclude the use of hydrogen or the effects thereof taught in Baldwin et al., particularly noting applicants' paragraph [0016], which includes the presence of hydrogen in the ion stream or the deposited coating. Furthermore, Baldwin et al. has input of hydrogen gas into the

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chamber (not into the ion source) for their use in preventing graphite-like chemical bonds (col. 9, lines 53-56), thus is not affecting the emissions from the ion stream, hence is neither included nor excluded by applicants' claim language.

While Baldwin et al. does not teach a particular percentage of  $sp^3$  carbon-carbon bonds in their deposits, they do teach that a-C:H deposits contain  $sp^3$  hybridization (col. 1, lines 58-col. 2, line 17, especially 5-10), and means of using the ion energy to effect the hardness, which one of ordinary skill in the art would recognize is affecting the percentage of  $sp^3$  hybridization. Therefore, it would have been obvious to one of ordinary skill in the art to adjust their average ion energy in order to produce the hardness desired for the particular end use, where higher energies that are said to produce the harder films would have been expected to have had higher percentages of  $sp^3$  hybridization, where routine experimentation would have reasonably been expected to determine the energy to promote the desired degree of hardness/percentage of  $sp^3$  hybridization especially given taught consideration thereof, and thus would have been expected to encompass claimed values.

Note that Baldwin et al. teach that deposition rate (col. 5, lines 5-13) varies with distance between source and substrate providing examples above a deposition rate of 2000 Å/min (= 33 Å/sec) at a few centimeters distance with 500 Å/min ( $\approx 8.3$  Å/sec).

As Baldwin et al. provide no spectra, i.e. no Raman spectra, or any other spectra, the examiner cannot directly evaluate whether or not peaks, as in claims 29-30 & 39-40, are or would have been produced, however as [0102] in the specification appears to indicate that a Raman spectra G-peak is related to the percentage of C-C  $sp^3$  content of the film, it appears that G-peaks in the claimed range of  $1490-1510\text{ cm}^{-1}$  would have been expected to be present **due to the presence of taught  $sp^3$  hybridization** as discussed above, especially considering discussions of producing hard a-C:H or DLC films, which necessitate the presence of the bond structures apparently required to create these peaks. The plasmon peak is discussed in the same paragraph, however the examiner cannot determine from the

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information given, exactly how it relates to density of the deposit, plasma deposition techniques, etc. (see above sections 4-5), however given the taught DLC & hard a-C:H films deposited, it would appear that plasmon peak values would have been expected to significantly encompass densities expected from Baldwin et al.'s deposits, especially when made from taught acetylene source gas, which probably, as near as can be determined from the lack of information on the meaning of the plasmon peaks, would correspond to plasmon values as claimed.

As previously set forth with respect to Baldwin et al. (179), applicants' 6/18/07 arguments & their previous citation of col. 5, lines 55-56 & col. 6, lines 3-8 as their sole reason for alleging Baldwin et al. teaches against applicants' claimed uniform impact energy distribution & substantially uniform weight distribution, the teachings of Baldwin et al. were previously re-reviewed with respect to this generic statement of advantage, however no other recitations with respect to the presence of any low[er] energy **ions** was found. Although more detailed description with respect low energy **reactive neutral species** was found, thus with all due consideration, the examiner must give more weight to the more detailed & explicit parts of Baldwin et al.'s disclosure, which provided the source of the various contributing components & described the lower energy component of the deposit that provides advantages to the deposition techniques as "...low energy, reactive neutral species... these low energy species reduced the average energy per carbon atom deposited..." (col. 5, lines 28-34), without any mention of ions as the low energy component (col. 6, lines 41-52 that discusses carbon[...neutral...species] deposited from over and above the carbon from the ion flux, & Baldwin et al.'s claims 29-32 that defined the ion energy with respect to the anode voltage, were also germane to the discussion of higher energy ions & lower energy neutral species), especially when one considers the reaction paths available with respect to Baldwin et al.'s suggested hydrocarbon source gas, **acetylene**, which would have been expected to be even more restricted due to its available reaction paths, than their preferred & exemplified methane source. This would appear to be an appropriate assessment when reviewing the "best mode" discussion

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on columns 7-8, where the application of a single anode voltage does not appear to provide any means for producing an ion energy distribution containing both high energy ions & low energy ions, which applicants previously asserted is required in Baldwin et al., but the "best mode" teaching would appear to be entirely consistent with ion energy supplied and defined by the anode voltage, with lower energy components being deposited coming from the neutralized activated species that are traveling with the ions in the Hall on ion source output, but are not themselves ions (hence are not excluded by applicants' claim language), & as the neutralized species are not being accelerated due to their lack of charge, they would be at a lower energy.

7. **Claims 19, 31-35 & 39-40** are rejected under 35 U.S.C. **103(a)** as being unpatentable over **Baldwin et al.** as applied to claims 3-5, 16-17, 20, 23-30 & 37-38 above, and further in view of **Rabalais et al.** (5,374,318, previously discussed in sections 8-11 & 8 & 8 of the action mailed 3/29/2005 & 7/21/06 & 9/6/07, respectively).

While Baldwin et al. discusses desirable hard coating & optical properties of their diamondlike carbon deposits, they do not teach coating on a magnetic recording media, however as previously discussed, the secondary reference of Rabalais et al. discusses the usefulness of such carbon deposits for optical coatings or protective coatings on magnetic recording media, etc. (col. 1, lines 19-48), thus motivating the specifically claimed enduse, as Rabalais et al. shows the desirability of properties as are produced in Baldwin et al. used on such substrates.

8. Applicant's arguments filed **5/12/2008 & discussed above** have been fully considered but they are not persuasive.

Applicants' arguments with respect to the art remains essentially the same as previously presented, and as previously discussed while their citation of Baldwin's teaching, such as found on columns 6, lines 3-8, which are might be relevant to Baldwin's preferred teachings of exemplary source gases such as methane, it must remain considered given the above reasonable analysis with respect to the

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more detailed disclosures in Baldwin et al. as previously presented, it does not appear that such split low & high ion distributions would be appropriately or reasonably applied to Baldwin suggested use of the acetylene. The examiner notes that experimental evidence presented commensurate scope with claim limitations might be presented to show whether or not applicants are warranted in their blanket application of select teachings in Baldwin et al. to all alternative gas sources, including use of acetylene, as suggested by Baldwin et al. Thus, questions remain, such as can applicants provide any evidence on why the particularly defined ion energies with respect to the anode voltages would include both high & low energy components, as opposed to the more detailed descriptions breaking down of Hall ion source outputs as being **ion** energies produced at a given voltage (high energy component) combined with low energy reactive **neutral** species (low energy component), especially when employing the suggested acetylene gas, which would inherently have a narrower weight distribution of ions due to its inherent reaction paths than other hydrocarbon gases? Or would applicants have any support for eliminating the contribution of neutral (lower energy) species to the deposition, which would differentiate from Baldwin et al.'s technique as described in detail?

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on M-F from about 9:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks, can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Marianne L. Padgett/  
Primary Examiner, Art Unit 1792

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